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(30) 1994/11/09 (08/336,456) US  
(54) PAPIERS NETTOYANTS TRAITÉS AVEC UNE EMULSION  
D'EAU EN LIPIDE  
(54) CLEANING TISSUES TREATED WITH WATER-IN-LIPID  
EMULSION

(57) L'invention se rapporte à des serviettes nettoyantes de type humide et à des articles similaires utilisés pour retirer les souillures périanales. Ces serviettes nettoyantes comprennent un substrat support, tel qu'une bande de papier de soie, et une émulsion eau en lipide appliquée sur le substrat. La phase lipidique continue de cette émulsion est suffisamment fragile pour rompre lorsqu'elle est soumise à un faible cisaillement lors de son utilisation, afin de libérer la phase aqueuse dispersée.

(57) Wet-like cleaning wipes and similar articles that are particularly useful in removing perianal soils. These wipes comprise a carrier substrate such as tissue paper web and a water-in-lipid emulsion applied to the substrate. The continuous lipid phase in this emulsion is sufficiently brittle that it ruptures when subjected to low shear during use to release the dispersed water phase.



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| (57) Abstract<br><p>Wet-like cleaning wipes and similar articles that are particularly useful in removing perianal soils. These wipes comprise a carrier substrate such as tissue paper web and a water-in-lipid emulsion applied to the substrate. The continuous lipid phase in this emulsion is sufficiently brittle that it ruptures when subjected to low shear during use to release the dispersed water phase.</p>  |  |   |   |

## CLEANING TISSUES TREATED WITH WATER-IN-LIPID EMULSION

TECHNICAL FIELD

This application relates to articles that are useful in cleansing and especially in removing perianal soils. This application particularly relates to wet-like cleaning wipes made from carrier substrates treated with a high internal water phase inverse emulsion.

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BACKGROUND OF THE INVENTION

Cleansing the skin is a personal hygiene problem not always easily solved. Of course, the common procedure of washing the skin with soap and water works well, but at times may be either unavailable or inconvenient to use. While soap and water could be used to clean the perianal region after defecation for example, such a 10 procedure would be extremely burdensome. Dry tissue products are therefore the most commonly used post-defecation anal cleansing product. These dry tissue products are usually referred to as "toilet tissue" or "toilet paper."

The perianal skin is marked by the presence of fine folds and wrinkles (sulci) and by hair follicles which make the perianal region one of the more difficult 15 anatomical areas to cleanse. During defecation, fecal matter is excreted through the anus and tends to accumulate in hard to reach locations such as around the base of hairs and in the sulci of the skin's surface. As the fecal matter dehydrates upon exposure to the air, or upon contact with an absorbent cleansing implement such as

tissue paper, it adheres more tenaciously to the skin and hair, thus making subsequent removal of the remaining dehydrated soil even more difficult.

Failure to remove fecal matter from the anal area can have a deleterious effect on personal hygiene. The fecal matter remaining on the skin after post-defecation 5 cleansing has a high bacterial and viral content, is malodorous and is generally dehydrated. These characteristics increase the likelihood of perianal disorders and cause personal discomfort (e.g., itching, irritation, chafing, etc.). Further, the residual fecal matter stains undergarments and causes unpleasant odors to emanate from the anal region. Thus, the consequences of inadequate perianal cleansing are clearly 10 unattractive.

For those individuals suffering from anal disorders such as pruritis ani, hemorrhoids, fissures, cryptitis, or the like, the importance of adequate perianal cleansing takes on heightened significance. Perianal disorders are usually characterized by openings in the skin through which the bacteria and viruses in the residual fecal 15 matter can readily enter. Those people afflicted with anal disorders must, therefore, achieve a high degree of perianal cleansing after defecation or risk the likely result that their disorders will be aggravated by the bacteria and viruses remaining on the skin.

At the same time anal disorder sufferers face more severe consequences from insufficient post defecation cleaning, they have greater difficulty in achieving a 20 satisfactory level of soil removal. Anal disorders generally render the perianal region extremely sensitive and attempts to remove fecal matter from this region by wiping with even normal wiping pressure causes pain and can further irritate the skin. Attempts to improve soil removal by increasing the wiping pressure can result in 25 intense pain. Conversely, attempts to minimize discomfort by reducing the wiping pressure result in an increased amount of residual fecal matter left on the skin.

Conventional toilet tissue products used for anal cleaning are essentially dry, 30 low density tissue papers that rely exclusively on mechanical processes to remove fecal matter from the perianal skin. These conventional products are rubbed against the perianal skin, typically with a pressure of about 1 psi (7 kilopascals) and basically scrape or abrade the fecal matter from the skin. After the first few wipes, the upper portion of the soil layer is removed because the wiping process is able to overcome the soil-soil cohesive forces that exist within the fecal matter. A cleavage is thereby created in the soil layer itself with the upper portion of the fecal layer being removed and the lower portion of the soil remaining adhered to the perianal skin.

35 Conventional tissue products are absorbent and with each successive wipe the fecal matter becomes increasingly dehydrated, causing it to adhere more tenaciously to

the perianal skin and hair and making its removal difficult in the extreme. Pressing the tissue forcefully against the perianal skin will remove more of the fecal matter but is intensely painful for people suffering from anal disorders and can excoriate even normal perianal skin, potentially causing irritation, inflammation, pain, bleeding, and infection.

5 To improve perianal cleaning, wipes have been developed that are kept in some sort of dispenser and are typically soaked in a reservoir of a moistening solution. Examples of such products include wipes that are often used to clean babies after bowel movements and can have other additives in the moistening solution to soothe 10 the skin. These wipes can have permanent wet strength such that they are not flushable. Also, these prior wipes are often too wet to dry the skin and tend to have a "cold" feel. There is also a lack of consistency in terms of the moisture content of each of the wipes.

15 Moistenable dry tissue products have also been used in perianal cleaning. These moistenable tissue products usually have temporary wet strength such that they are flushable. However, the users of these products have to wet the tissue which can be inconvenient. It is also difficult to get right moisture level on such products. Also, the temporary wet strength of such products is typically inadequate and needs to be improved.

20 Accordingly, it would be desirable to provide products for perianal cleaning that: (1) have consistent levels of moistening solution; (2) can have adequate temporary wet strength so as to be flushable; (3) have an adequate, consistent moisture level to provide effective cleaning; and (4) remain essentially dry until used for cleaning purposes.

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#### DISCLOSURE OF THE INVENTION

The present invention relates to articles useful in cleansing, and particularly wet-like cleansing wipes that are especially useful in removing perianal soils. These articles comprise:

- 30 a. a carrier;
- b. a water-in-lipid emulsion applied to the carrier, the emulsion comprising:
  - (1) from about 2 to about 60% of a continuous solidified lipid phase comprising a waxy lipid material having a melting point of about 30°C or higher;

- (2) from about 3% to about 97% of an internal water phase dispersed in the lipid phase; and
- (3) an effective amount of an emulsifier capable of forming the emulsion when the lipid phase is in a fluid state.

5 The present invention further relates to a method for making these articles.

This method comprises the steps of:

- A. forming a water-in-lipid emulsion comprising:
  - (1) from about 2 to about 60% of a continuous lipid phase comprising a waxy lipid material having a melting point of about 10 30°C or higher;
  - (2) from about 3% to about 97% of an internal water phase dispersed in the lipid phase; and
  - (3) an effective amount of an emulsifier capable of forming the emulsion when the lipid phase is in a fluid state;
- 15 B. applying the emulsion to a carrier at a temperature sufficiently high such that the lipid phase has a fluid or plastic consistency;
- C. cooling the applied emulsion to a temperature sufficiently low such that the lipid phase solidifies.

These articles have a number of significant advantages over prior cleaning 20 products, especially when in the form of wet-like cleansing wipes used to remove perianal soils. These articles release significant quantities of water during use for comfortable, more effective cleaning. The continuous lipid phase of the emulsion is sufficiently brittle so as to be easily disrupted by low shear contact (e.g., during the wiping of the skin) to readily release this internal water phase, but sufficiently tough to 25 avoid premature release of the water phase during the rigors of processing. The continuous lipid phase of these articles is also sufficiently stable during storage so as to prevent significant evaporation of the internal water phase. The normal tensile strength and flushability properties of these articles are not adversely affected when treated with the high internal phase inverse emulsions of the present invention. As a result, users of 30 these articles get comfortable, efficient, moist cleaning without having to change their normal cleaning habits.

Besides perianal cleaning, these articles can be used in many other applications 35 requiring the delivery of water, as well as water soluble or dispersible actives. These include hard surface cleaning of floors, countertops, sinks, bathtubs, toilets, and the like, as well as the delivery of water-soluble or dispersible antimicrobial or pharmaceutical actives. These articles can also perform multiple functions. For

example, the high internal phase inverse emulsion applied to these articles can be formulated to provide cleaning and waxing benefits at the same time when used on items such as furniture, shoes, automobiles, and the like.

#### BRIEF DESCRIPTION OF THE DRAWING

5 Figure 1 is a schematic representation illustrating a spray system for applying the high internal phase inverse emulsions of the present invention to a carrier substrate such as a paper web.

10 Figure 2 is a schematic representation illustrating a system for applying the high internal phase inverse emulsions of the present invention by flexible rotogravure coating to a carrier substrate such as a paper web.

#### DETAILED DESCRIPTION OF THE INVENTION

15 As used herein, the term "comprising" means that the various components, ingredients, or steps, can be conjointly employed in practicing the present invention. Accordingly, the term "comprising" encompasses the more restrictive terms "consisting essentially of" and "consisting of."

20 All percentages, ratios and proportions used herein are by weight unless otherwise specified.

##### A. Carriers for High Internal Phase Inverse Emulsion

25 Carriers useful in the present invention can be in variety of substrate forms. Suitable carrier substrates include woven materials, nonwoven materials, foams, sponges, battings, balls, puffs, films, and the like. Particularly preferred substrates for use in the present invention are nonwoven types. These nonwoven substrates can comprise any conventionally fashioned nonwoven sheet or web having suitable basis weight, caliper (thickness), absorbency and strength characteristics. Nonwoven substrates can be generally defined as bonded fibrous or filamentous products having a web structure, in which the fibers or filaments are distributed haphazardly as in "air-laying" or certain "wet-laying" processes, or with a degree of orientation, as in certain "wet-laying" or "carding" processes. The fibers or filaments of such nonwoven substrates can be natural (e.g., wood pulp, wool, silk, jute, hemp, cotton, linen, sisal or ramie) or synthetic (e.g., rayon, cellulose ester, polyvinyl derivatives, polyolefins,

sorbitan stearates, sorbitan triooleate, sorbitan dipalmitates, glyceryl monostearate, glyceryl monopalmitate, glyceryl monobehenate, sucrose triaurate, sucrose distearate, diglycerol monooleate, tetraglycerol monooleate, and mixtures thereof.

4. The article of any of Claims 1 to 3 characterized that said emulsion further comprises a component selected from the group consisting of perfumes, antimicrobial actives, pharmaceutical actives, deodorants, opacifiers, astringents, skin moisturizers, and mixtures thereof, preferably glycerin.

5. The article of any of Claims 1 to 3 characterized in that it further comprises a detergent surfactant separate from said emulsion, said detergent surfactant having an HLB value in the range of from about 10 to about 25, preferably selected from the group consisting of sodium linear alkylbenzene sulfonates, sodium linear alkyl ethoxy sulfates, alkyl ethoxylates, alkyl amine oxides, alkyl polyglycosides, ditallow dimethyl ammonium salts, cetyl trimethyl ammonium salts, lauryl trimethyl ammonium salts, and mixtures thereof.

6. The article of any of Claim 1 to 5 characterized that said carrier is a paper web and further characterized in that said emulsion is applied to both sides of said web.

7. The article of Claim 6 characterized in that said web comprises two plies having opposed inner surfaces and further characterized in that said emulsion is applied to at least one of said opposed inner surfaces.

8. A method for applying a water-in-lipid emulsion to a carrier, which comprises the steps of:

A. forming a water-in-lipid emulsion comprising:

(1) from 2 to 60%, preferably from 5 to 30%, most preferably 6 to 15%, of a continuous solidified lipid phase comprising a waxy lipid material having a melting point of about 30°C or higher, preferably in the range of from 40° to 80°C, most preferably in the range of from 60° to 70°C;

- (2) from 39 to 97%, preferably from 67 to 92%, most preferably from 82 to 91%, of an internal water phase dispersed in said lipid phase; and
- (3) from 1 to 10%, preferably from 3 to 6%, of an emulsifier capable of forming said emulsion when said lipid phase is in a fluid state;

B. applying the emulsion to a carrier at temperature sufficiently high such that the lipid phase has a fluid or plastic consistency, preferably in the range of from 60° to 90°C, most preferably from 70° to 80°C;

C. cooling the applied emulsion to a temperature sufficiently low such that the lipid phase solidifies.

9. The process of Claim 8 characterized in that the emulsion is applied to the carrier by a step selected from the group consisting of spraying, printing, coating, extruding, and combinations thereof, preferably by spraying or flexible rotogravure coating, most preferably at a constant volumetric flow rate.

10. The process of any of Claims 8 to 9 characterized in that the emulsion is applied to both sides of the paper web simultaneously.

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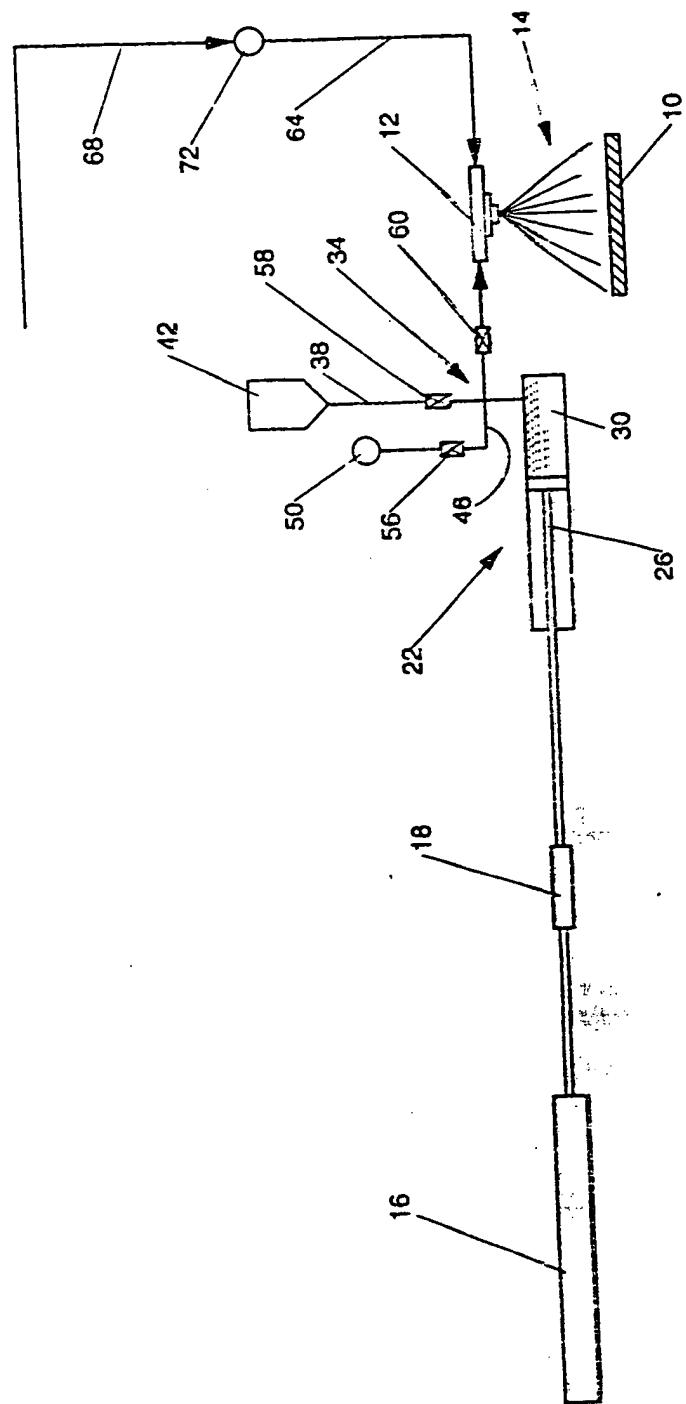


Fig. 1

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